Complete Summary

GUIDELINE TITLE

Procedure guideline for somatostatin receptor scintigraphy with In-111 pentetreotide.

BIBLIOGRAPHIC SOURCE(S)

Society of Nuclear Medicine. Procedure guideline for somatostatin receptor scintigraphy with In-111 pentetreotide. Reston (VA): Society for Nuclear Medicine; 2001 Feb 11. 9 p. (Society of Nuclear Medicine procedure guidelines; no. 3.0).

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Neuroendocrine and non-neuroendocrine tumors containing somatostatin receptors

GUIDELINE CATEGORY

Diagnosis
Evaluation

CLINICAL SPECIALTY

Nuclear Medicine
Oncology
Radiology

INTENDED USERS

Allied Health Personnel
Physicians

GUIDELINE OBJECTIVE(S)

To assist nuclear medicine practitioners in recommending, performing, interpreting, and reporting the results of somatostatin receptor scintigraphy with In-111 pentetreotide

TARGET POPULATION

Patients with neuroendocrine and non-neuroendocrine tumors containing somatostatin receptors

INTERVENTIONS AND PRACTICES CONSIDERED

Somatostatin receptor scintigraphy with In-111 pentetreotide

This procedure guideline only covers imaging with In-111 pentetreotide. Imaging with other somatostatin analogs (e.g., Tc-99m depreotide) is not addressed in this guideline.

MAJOR OUTCOMES CONSIDERED

Sensitivity and specificity of somatostatin receptor scintigraphy with In-111 pentetreotide

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Hand-searches of Published Literature (Secondary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Relevant guidelines from other organizations were reviewed and taken into consideration. Literature searches were performed to include current scientific evidence. In addition, references known to experts and references from the nuclear medicine community were considered.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Not stated

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

METHODS USED TO ANALYZE THE EVIDENCE

Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Drafts of the guideline were submitted to members of the Guideline Development subcommittee (methodologists) and the Task Force (subject experts). These reviewers indicated on a line-by-line basis any suggestions or recommendations for the revision of the guideline. The percentage of agreement for all reviewers was calculated for each revision and compiled by the Society of Nuclear Medicine (SNM) central office. It is expected that the percentage of agreement will increase with each revision.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

When the Task Force and Guideline Development Subcommittee completed their edits, draft procedure guidelines were distributed to the Society of Nuclear Medicine (SNM) Sample Review Group for comment. (The SNM Sample Review Group is a cross-section of approximately 100 nuclear medicine practitioners representing every field of specialization).

The guideline was approved by the SNM Commission on Health Care Policy, the Board of Directors, and the House of Delegates.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Background Information and Definitions

Indium-111 pentetreotide is a [In-111 DTPA-D-Phe-] conjugate of octreotide, a somatostatin analog that binds to somatostatin receptors (predominantly somatostatin receptor subtypes sst2 and sst5). This octapeptide concentrates in neuroendocrine and some non-neuroendocrine tumors containing somatostatin receptors. Tumors that may be detected by somatostatin receptor scintigraphy with In-111 pentetreotide include, but are not limited to:

- Adrenal medullary tumors (pheochromocytoma, neuroblastoma, ganglioneuroma)
- Gastroenteropancreatic (GEP) tumors, e.g., gastrinoma, insulinoma, glucagonoma, vasoactive intestinal polypeptide secreting tumor (VIPoma) and non-functioning gastroenteropancreatic tumors
- Carcinoid tumors
- Medullary thyroid carcinoma
- Melanoma
- Merkel cell tumor of the skin
- Paraganglioma
- Pituitary adenomas
- Small-cell lung carcinoma

Other tumors and disease processes may also be detected by In-111 pentetreotide scintigraphy and knowledge of the patient´s history is thus important. These disorders may include, but are not limited to:

- Astrocytomas
- Benign and malignant bone tumors
- Breast carcinoma
- Differentiated thyroid carcinoma (papillary, follicular, Hürthle cell)
- Lymphoma (Hodgkin´s and non-Hodgkin´s)
- Meningioma
- Non-small cell lung carcinoma
- Prostate carcinoma
- Renal cell carcinoma
- Sarcomas
- Autoimmune diseases (e.g., rheumatoid arthritis, Graves´ disease, Graves´ ophthalmopathy)
- Bacterial pneumonia
- Cerebrovascular accident
- Fibrous dysplasia
- Granulomas (e.g., tuberculosis, sarcoid)
- Radiation pneumonitis

In addition to these tumors, normal organs, such as the pituitary, thyroid, spleen, liver, and renal parenchyma also demonstrate avidity for this tracer. The

gallbladder, bowel, renal collecting systems, ureters and urinary bladder are seen as a result of clearance of In-111 pentetreotide.

Indications

- Detection and localization of a variety of suspected neuroendocrine and some non-neuroendocrine tumors and their metastases
- Staging patients with neuroendocrine tumors
- Determination of somatostatin-receptor status (patients with somatostatin receptor-positive tumors may be more likely to respond to octreotide therapy)
- Follow-up of patients with known disease to evaluate potential recurrence
- Selection of patients with metastatic tumors for peptide receptor radionuclide therapy (PRRT) and prediction of the effect of peptide receptor radionuclide therapy, where available

Procedure

The detailed procedure recommendations in the guideline address the following areas: patient preparation, information pertinent to the procedure (i.e., important data that the physician should have about the patient at the time the exam is performed and interpreted), precautions, information regarding the radiopharmaceutical (i.e., ranges of administered activity, organ receiving the largest dose, effective dose), image acquisition, interventions, processing, interpretation criteria, reporting, quality control, and sources of error.

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is not specifically stated for the recommendations.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Maximize the diagnostic information obtained in the study while minimizing the resources that are expended.

Subgroups Most Likely to Benefit:

Patients with somatostatin receptor-positive tumors (because such tumors are more likely to respond to octreotide therapy).

POTENTIAL HARMS

Severe hypoglycemia may be induced in patients with insulinoma.

Potential causes for false-positive interpretation:

- Accumulation of In-111 pentetreotide in the nasal and pulmonary hilar areas can be seen with respiratory infections
- Diffuse pulmonary or pleural accumulation of In-111 pentetreotide can be observed following radiation therapy to the lung or bleomycin therapy
- The tracer may accumulate at recent surgical and colostomy sites
- Accumulation of the tracer in normal structures (pituitary, thyroid, liver, spleen, kidneys, bowel, gallbladder, ureters, bladder, stimulated adrenal glands) and in multiple disorders (listed in the "Major Recommendations" field) must be kept in mind. Caution must be used to avoid interpreting physiologic gallbladder activity as hepatic metastasis.

Potential causes for false-negative interpretations:

- Presence of unlabeled somatostatin, either as a result of octreotide therapy or due to production of somatostatin by the tumor itself may lower tumor detectability, however, there are also literature reports of improved tumor-to-background ratio following pretreatment with non-radioactive octreotide.
- Different somatostatin receptor subtypes have different affinities for the radioligand; variable tumor differentiation/receptor expression also influences tumor detectability. This is a consideration, especially with insulinomas and medullary thyroid carcinomas.
- Liver metastases of neuroendocrine tumors may appear isointense because of a similar degree of tracer accumulation by the normal liver. Correlation with anatomic imaging or subtraction scintigraphy with sulfur colloid may be considered.

Subgroups Most Likely to be Harmed:

Precautions:

- In patients suspected of having insulinoma, an intravenous infusion of glucose should be available because of the potential for inducing severe hypoglycemia.
- In-111 penetreotide should not be injected into intravenous lines for, or together with solutions for total parenteral nutrition.

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

The Society of Nuclear Medicine has written and approved guidelines to promote the cost-effective use of high quality nuclear medicine procedures. These generic recommendations cannot be applied to all patients in all practice settings. The guidelines should not be deemed inclusive of all proper procedures or exclusive of other procedures reasonably directed to obtaining the same results. The spectrum of patients seen in a specialized practice setting may be quite different than the spectrum of patients seen in a more general practice setting. The appropriateness

of a procedure will depend in part on the prevalence of disease in the patient population. In addition, the resources available to care for patients may vary greatly from one medical facility to another. For these reasons, guidelines cannot be rigidly applied.

Advances in medicine occur at a rapid rate. The date of a guideline should always be considered in determining its current applicability.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Living with Illness

IOM DOMAIN

Effectiveness
Safety

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Society of Nuclear Medicine. Procedure guideline for somatostatin receptor scintigraphy with In-111 pentetreotide. Reston (VA): Society for Nuclear Medicine; 2001 Feb 11. 9 p. (Society of Nuclear Medicine procedure guidelines; no. 3.0).

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2001 Feb 11

GUIDELINE DEVELOPER(S)

Society of Nuclear Medicine, Inc - Medical Specialty Society

SOURCE(S) OF FUNDING

Society of Nuclear Medicine (SNM)

GUIDELINE COMMITTEE

Guideline Development Committee

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Authors: Helena R. Balon, MD (William Beaumont Hospital, Royal Oak, MI); Stanley J. Goldsmith, MD (New York Hospital-Cornell Medical, New York, NY); Barry A. Siegel, MD (Mallinckrodt Institute of Radiology, St. Louis, MO); Edward B. Silberstein, MD (University of Cincinnati Medical Center, Cincinnati, OH); Kevin J. Donohoe, MD (Beth Isreal Deaconess Medical Center, Boston, MA); Eric P. Krenning, MD, PhD (University Hospital Dijkzigt, Rotterdam, Netherlands); and Otto Lang, MD (3rd Medical School, Charles University, Prague, Czech Republic).

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

An update is not in progress at this time.

GUIDELINE AVAILABILITY

Electronic copies: Available from the Society of Nuclear Medicine (SNM) Web site.

Print copies: Available from SNM, Division of Health Care Policy, 1850 Samuel Morse Dr, Reston, VA 20190-5316; Phone: 1-800-513-6853 or 1-703-326-1186; Fax: 703-708-9015; E-Mail: ServiceCenter@snm.org.

AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- Society of Nuclear Medicine. Procedure guideline for guideline development. Reston (VA): Society of Nuclear Medicine; 2001 Jun (version 3.0).

  Electronic copies: Available from the Society of Nuclear Medicine Web site.

- Society of Nuclear Medicine. Performance and responsibility guidelines for NMT. Reston (VA): Society of Nuclear Medicine; 2003.

  Electronic copies: Available from the Society of Nuclear Medicine Web site.

Print copies: Available from SNM, Division of Health Care Policy, 1850 Samuel Morse Dr, Reston, VA 20190-5316; Phone: 1-800-513-6853 or 1-703-326-1186; Fax: 703-708-9015; E-Mail: ServiceCenter@snm.org.

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on November 17, 2001. It was verified by the guideline developer as of November 27, 2001.

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